第6章习题 编程题

T2

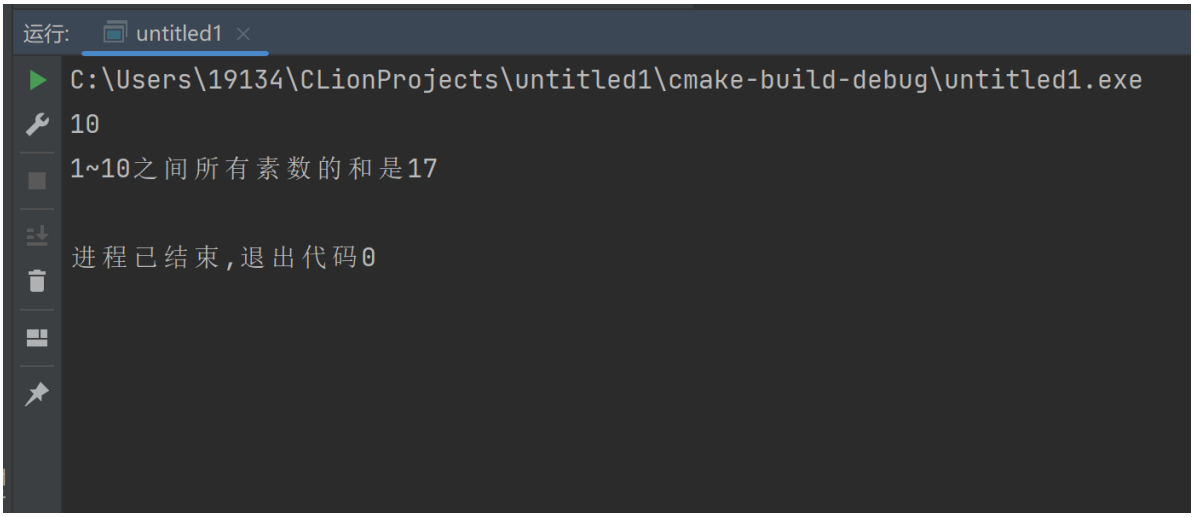
代码编写如下：

```c
#include <stdio.h>

int main() {
    int n, sum = 0;
    scanf("%d", &n);
    int isPrime(int i);
    for (int i = 1; i <= n; i++)
        sum += isPrime(i);
    printf("1~%d之间所有素数的和是%d\n", n, sum);
}

int isPrime(int i) {
    if (i == 1)
        return 0;
    for (int j = 2; j < i; j++)
        if (i % j == 0)
            return 0;
    return i;
}
```

运行结果如下：



> 1~10之间的素数有2，3，5，7，和是17，运行正确。

T10

代码编写如下：

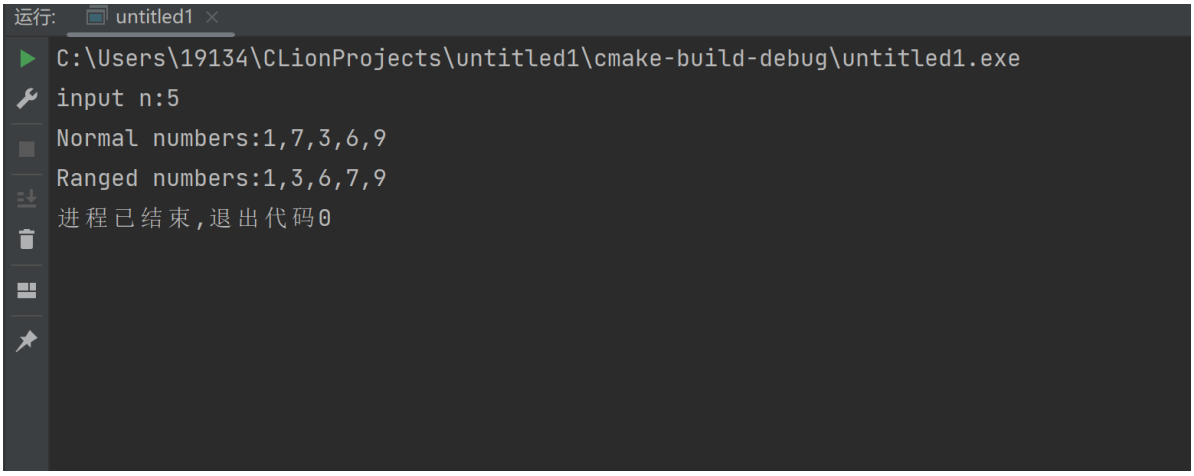
```
#include <stdio.h>
#include <stdlib.h>
int main() {
    int n, i, *num, *p;
    printf("input n:");
    scanf("%d", &n);
    num = (int *) malloc(sizeof(int) * n);
    p = num;

    printf("Normal numbers:");
    for (i = 0; i < n; i++)
        scanf("%d", p + i);

    void sort(int *num, int n);
    sort(num, n);

    printf("Ranged numbers:");
    for (i = 0; i < n; i++)
        printf("%2d,", *(num + i));
    printf(" \b\b\n");
}
void sort(int *num, int n) {
    int pos, tmp, i, j;
    for (i = 0; i < n - 1; i++) {
        pos = i;
        for (j = i + 1; j < n; j++)
            if (*(num + j) < *(num + pos))
                pos = j;
        if (i != pos)
            tmp = *(num + i), *(num + i) = *(num + pos), *(num + pos) = tmp;
    }
}
```

运行结果：



T13

代码编写如下：

```c
#include <stdio.h>

int judge(int num){
    int i,sum=0;
    for(i=1;i<num;i++)
        if(num%i==0)
            sum+=i;
    if(sum==num)
        return 1;
    else
        return 0;
}

int main() {
    int num;
    for (num = 2; num <= 1000; num++) {
        if (judge(num))
            printf("%d\n", num);
    }
    return 0;
}
```

运行结果如下：

T15

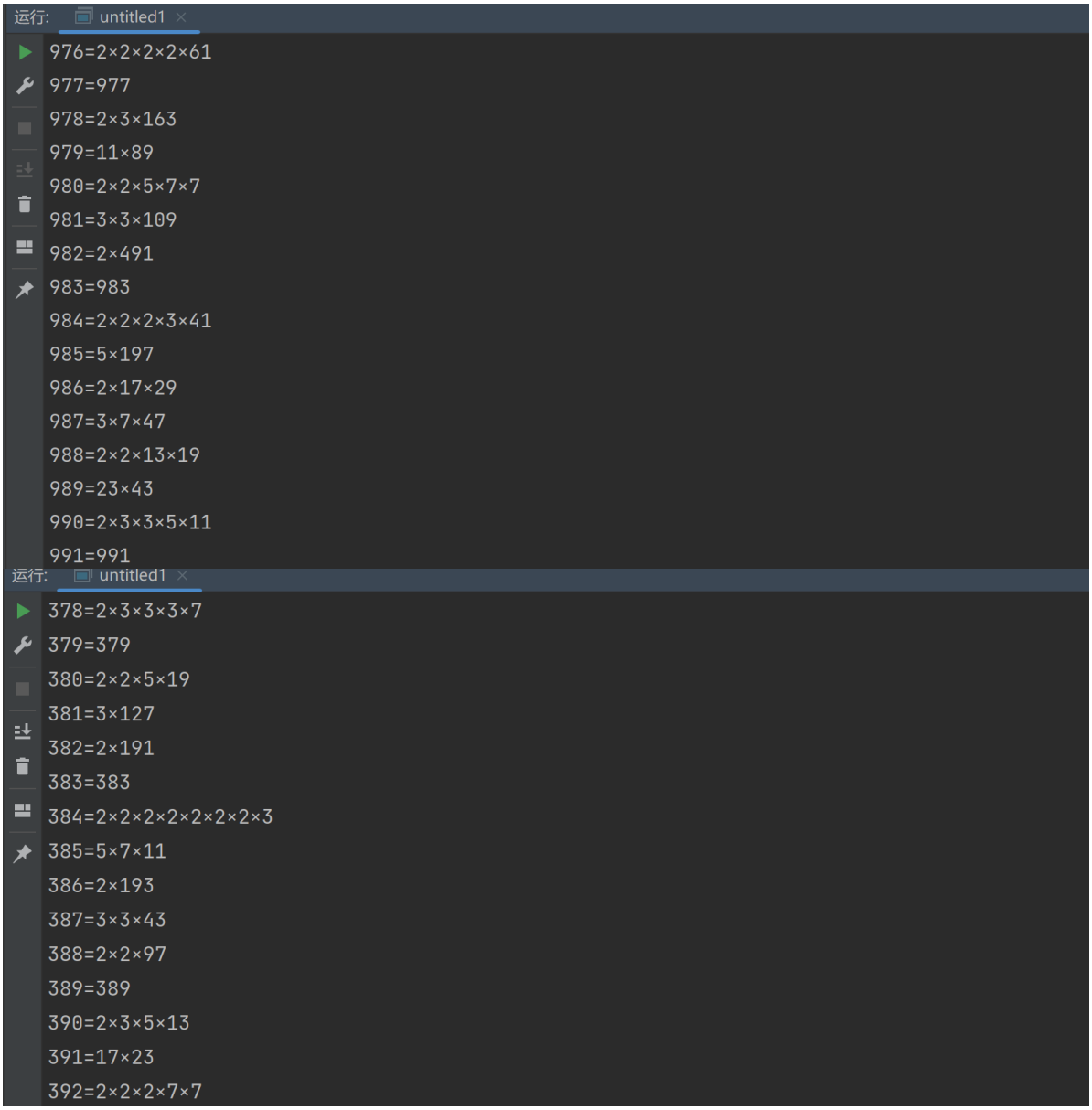
main.c文件如下：

```c
#include "fun.h"
int main() {
    int prime[168];
    FindPrime(prime);
    for (int num = 100; num < 1000; num++)
        fun(num, prime);
}
```

fun.h文件编写如下：

```c
#include <stdio.h>
void FindPrime(int *prime) {
    prime[0] = 2;
    int count = 1, i, num;
    for (num = 3; num <= 1000; num++) {
        for (i = 2; i < num; i++) {
            if (num % i == 0)
                break;
            if (i == num - 1)
                prime[count++] = num;
        }
    }
}
int exist(int n, int *prime) {
    for (int i = 0; i < 168; i++) {
        if (prime[i] == n)
            return 1;
        else if(prime[i]>n||i==167)
            return 0;
    }
}
void fun(int num, int *prime) {
    printf("\n%d=", num);
    if (exist(num, prime))
        printf("%d", num);
    else {
        int i = 0;
        for (i = 0; i < 168; i++) {
            if (num % prime[i] == 0) {
                printf("%d", prime[i]);
                num /= prime[i];
                i = -1;
                if (num != 1) {
                    printf("x");
                }
            }
        }
    }
}
```

部分运行结果如下图：


运行:
untitled1
976=2×2×2×2×61
977=977
978=2×3×163
979=11×89
980=2×2×5×7×7
981=3×3×109
982=2×491
983=983
984=2×2×2×3×41
985=5×197
986=2×17×29
987=3×7×47
988=2×2×13×19
989=23×43
990=2×3×3×5×11
991=991
运行:
untitled1
378=2×3×3×3×7
379=379
380=2×2×5×19
381=3×127
382=2×191
383=383
384=2×2×2×2×2×2×2×3
385=5×7×11
386=2×193
387=3×3×43
388=2×2×97
389=389
390=2×3×5×13
391=17×23
392=2×2×2×7×7